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DEPARTMENT OF COMMERCE

Bureau of Industry and Security

15 CFR Part 744

[Docket No. 180712626-8840-01]

RIN 0694-AH61

Review of Controls for Certain Emerging Technologies

AGENCY: Bureau of Industry and Security, Commerce.

ACTION: Advance notice of proposed rulemaking (ANPRM).

SUMMARY: The Bureau of Industry and Security (BIS) controls the export of dual-use and less sensitive military items through the Export Administration Regulations (EAR), including the Commerce Control List (CCL). As controls on exports of technology are a key component of the effort to protect sensitive U.S. technology, many sensitive technologies are listed on the CCL, often consistent with the lists maintained by the multilateral export control regimes of which the United States is a member. Certain technologies, however, may not yet be listed on the CCL or controlled multilaterally because they are emerging technologies. As such, they have not yet been evaluated for their national security impacts. This advance notice of proposed rulemaking (ANPRM) seeks public comment on criteria for identifying emerging technologies that are essential to U.S. national security, for example because they have potential conventional weapons, intelligence collection, weapons of mass destruction, or terrorist applications or could

provide the United States with a qualitative military or intelligence advantage. Comment on this ANPRM will help inform the interagency process to identify and describe such emerging technologies. This interagency process is anticipated to result in proposed rules for new Export Control Classification Numbers (ECCNs) on the CCL.

DATES: Submit comments on or before [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

ADDRESSES: You may submit comments through either of the following:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. The identification number for this rulemaking is BIS 2018-0024.
- *Address:* By mail or delivery to Regulatory Policy Division, Bureau of Industry and Security, U.S. Department of Commerce, Room 2099B, 14th Street and Pennsylvania Avenue, NW, Washington, DC 20230. Refer to RIN 0694-AH61.

FOR FURTHER INFORMATION CONTACT: Kirsten Mortimer, Office of National Security and Technology Transfer Controls, Bureau of Industry and Security, Department of Commerce. Phone: (202) 482-0092; Fax (202) 482-3355; Email: Kirsten.Mortimer@bis.doc.gov.

SUPPLEMENTARY INFORMATION:

Background

As part of the National Defense Authorization Act (NDAA) for Fiscal Year 2019, Public Law No: 115-232, Congress enacted the Export Control Reform Act of 2018 (the Act or ECRA). Section 1758 of the Act authorizes Commerce to establish appropriate controls, including interim

controls, on the export, reexport, or transfer (in country) of emerging and foundational technologies. Under the Act, emerging and foundational technologies are those essential to the national security of the United States and are not described in Section 721(a)(6)(A)(i)-(v) of the Defense Production Act of 1950, as amended. Emerging and foundational technologies, in keeping with ECRA, will be determined by an interagency process that will consider both public and classified information as well as information from the Emerging Technology Technical Advisory Committee and the Committee on Foreign Investment in the United States.

In identifying emerging and foundational technologies, the process must consider:

- The development of emerging and foundational technologies in foreign countries;
- The effect export controls may have on the development of such technologies in the United States; and
- The effectiveness of export controls on limiting the proliferation of emerging and foundational technologies in foreign countries.

To help inform this process, this advance notice of proposed rulemaking (ANPRM) proposes several general areas for public comment. Given the challenges involved in identifying emerging and foundational technologies, this ANPRM will help Commerce and other agencies propose specific emerging technologies for control.

Once an emerging or foundational technology has been identified, the Act authorizes Commerce to establish controls, including interim controls, on the export, reexport, or transfer (in-country) of that technology. In determining the appropriate level of export controls, the Department must consider the potential end-uses and end-users of the technology, and countries to which exports from the United States are restricted (e.g., embargoed countries). While Commerce has

discretion to set the level of export controls, at a minimum it must require a license for the export of emerging and foundational technologies to countries subject to a U.S. embargo, including those subject to an arms embargo. Responses to this ANPRM will help Commerce and other agencies identify and assess emerging technologies for the purposes of updating the export control lists without impairing national security or hampering the ability of the U.S. commercial sector to keep pace with international advances in emerging fields.

Emerging Technologies

To assist BIS in identifying emerging technologies that are essential to the national security of the United States, this ANPRM seeks public comment on criteria for defining and identifying emerging technologies. This ANPRM describes certain categories of technology that are currently subject to the EAR but controlled only to embargoed countries, countries designated as supporters of international terrorism, and restricted end uses or end users. These categories are a representative list of the technology categories from which Commerce, through an interagency process, seeks to determine whether there are specific emerging technologies that are important to the national security of the United States for which effective controls can be implemented that avoid negatively impacting U.S. leadership in the science, technology, engineering, and manufacturing sectors.

Commerce does not seek to expand jurisdiction over technologies that are not currently subject to the EAR, such as “fundamental research” described in § 734.8 of the EAR. For purposes of this ANPRM, Commerce does not seek to alter existing controls on technology already

specifically described in the CCL. Such controls would generally continue to be addressed through multilateral regimes or interagency reviews.

Foundational Technology

Commerce will issue a separate ANPRM regarding identification of foundational technologies that may be important to U.S. national security. Commerce seeks public comment, however, on treating emerging and foundational technologies as separate types of technology.

Representative Technology Categories

The representative general categories of technology for which Commerce currently seeks to determine whether there are specific emerging technologies that are essential to the national security of the United States include:

(1) Biotechnology, such as:

- (i) Nanobiology;
- (ii) Synthetic biology;
- (iv) Genomic and genetic engineering; or
- (v) Neurotech.

(2) Artificial intelligence (AI) and machine learning technology, such as:

- (i) Neural networks and deep learning (*e.g.*, brain modelling, time series prediction, classification);
- (ii) Evolution and genetic computation (*e.g.*, genetic algorithms, genetic programming);

- (iii) Reinforcement learning;
- (iv) Computer vision (*e.g.*, object recognition, image understanding);
- (v) Expert systems (*e.g.*, decision support systems, teaching systems);
- (vi) Speech and audio processing (*e.g.*, speech recognition and production);
- (vii) Natural language processing (*e.g.*, machine translation);
- (viii) Planning (*e.g.*, scheduling, game playing);
- (ix) Audio and video manipulation technologies (*e.g.* voice cloning, deepfakes);
- (x) AI cloud technologies; or
- (xi) AI chipsets.

(3) Position, Navigation, and Timing (PNT) technology.

(4) Microprocessor technology, such as:

- (i) Systems-on-Chip (SoC); or
- (ii) Stacked Memory on Chip.

(5) Advanced computing technology, such as:

- (i) Memory-centric logic.

(6) Data analytics technology, such as:

- (i) Visualization;
- (ii) Automated analysis algorithms; or

(iii) Context-aware computing.

(7) Quantum information and sensing technology, such as

(i) Quantum computing;

(ii) Quantum encryption; or

(iii) Quantum sensing.

(8) Logistics technology, such as:

(i) Mobile electric power;

(ii) Modeling and simulation;

(iii) Total asset visibility; or

(iv) Distribution-based Logistics Systems (DBLS).

(9) Additive manufacturing (*e.g.* 3D printing);

(10) Robotics such as:

(i) Micro-drone and micro-robotic systems;

(ii) Swarming technology;

(iii) Self-assembling robots;

(iv) Molecular robotics;

(v) Robot compliers; or

(vi) Smart Dust.

(11) Brain-computer interfaces, such as

- (i) Neural-controlled interfaces;
- (ii) Mind-machine interfaces;
- (iii) Direct neural interfaces; or
- (iv) Brain-machine interfaces.

(12) Hypersonics, such as:

- (i) Flight control algorithms;
- (ii) Propulsion technologies;
- (iii) Thermal protection systems; or
- (iv) Specialized materials (for structures, sensors, etc.).

(13) Advanced Materials, such as:

- (i) Adaptive camouflage;
- (ii) Functional textiles (e.g., advanced fiber and fabric technology); or
- (iii) Biomaterials.

(14) Advanced surveillance technologies, such as:

Faceprint and voiceprint technologies.

BIS welcomes comments on: 1) how to define emerging technology to assist identification of such technology in the future; 2) criteria to apply to determine whether there are specific

technologies within these general categories that are important to U.S. national security; 3) sources to identify such technologies; 4) other general technology categories that warrant review to identify emerging technology that are important to U.S. national security; 5) the status of development of these technologies in the United States and other countries; 6) the impact specific emerging technology controls would have on U.S. technological leadership; 7) any other approaches to the issue of identifying emerging technologies important to U.S. national security, including the stage of development or maturity level of an emerging technology that would warrant consideration for export control.

Comments should be submitted to BIS as described in the ADDRESSES section of this ANPRM by [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

This rule was determined to be significant by the Office of Management Budget under Executive Order 12866.

Dated: November 14, 2018

Matthew S. Borman

Deputy Assistant Secretary for Export Administration

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